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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,525	07/01/2005	Wolfgang Paulus	13111-00021-US	9339

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EXAMINER	
UNDERDAHL, THANE E	

ART UNIT	PAPER NUMBER
1651	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,525	PAULUS ET AL.	
	Examiner	Art Unit	
	Thane Underdahl	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) *43-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/24/05 and 5/18/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Election/Restriction Requirement.

Applicant's response, with traverse, to the Restriction/Election requirement filed on 11/16/07 is acknowledged. The Examiner acknowledges that a preliminary amendment was filed that cancelled the claims under restriction and submitted new claims. However the material covered in the previous claims was carried over to the new claims and now the groups are defined by the Applicant as follows:
Group I , new claims 23-37
Group II, new claims 38-45.
The Examiner agrees with this grouping and in the interest of compact prosecution, will accept the Applicant's election of group I to be examined on the merits.

The Applicant traverses the restriction requirement on the grounds that no burden exists in examiner the application. However the examiner is burdened to search both relevant patent and patent applications as well as non-patent literature in the examination of the claims.

However upon further review of the new claims 38-42 were similar enough to group I that they indeed are examined here as well, however claims 43-45 remain restricted since they are to a process of making a coating from the product made in the process of group I and remain distinct from group I.

Therefore, the Restriction/Election requirement is therefore made FINAL and the elected species and the claims they include will now be examined on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 23, 38, 40 and 41 contain optional steps. M.P.E.P. § 2111.04 state "Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure". Claims 40 and 41 are optional because the use the term "obtainable" which is **not synonymous** with "obtain". The broad use definition of obtainable is "capable of being obtained" which reads as optional language since the method is not limited to simply "being obtained" and leaves open the option for other

methods to be employed. Therefore it is unclear if the process of claim 38 actually includes the optional steps. For the purposes of examination, any optional steps will be given no patentable weight.

Claims 29, 37 and 38 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 contains the relative term “lower” without a context from which to compare. It is unclear how many carbons on an alkyl-substituted acrylic acid there may be to fall under the criteria of “lower” as opposed to “higher”. Clarification is required.

Claim 29 includes the limitation of a “completely acrylated” polyol acrylate. The polyol acrylate is made in the independent claim 23 there is no step for completely acrylating this polyol. The Examiner is confused since the degree of the acrylation in claim 23 is not defined in any step and this step is not included in claim 29 either. Clarification is required.

Claim 37 contains the phrase “alcohol…is removed from the reaction equilibrium”. "Reaction Equilibrium" while directly related to the reaction solution is not considered the solution itself. Clarification is required. In the interest of compact prosecution, the claim will read as alcohol and water are removed from the reaction solution.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 23, 24, 26-33, 35-38, 40 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown et al. (U.S. Patent # 5288619).

These claims are drawn to the method of enzymatically synthesizing polyol acrylates. A aliphatic polyol is reacted with an acrylic acid compound or alkyl ester of an acrylic acid in a liquid medium comprising an organic solvent in the presence of hydrolases that transfer acrylate groups. The liquid medium contains less than about 10% by volume water. The acrylic acid compound and polyol are used in a molar ratio of 100:1 to 1:1. The acrylic acid compound can be simply an acrylic acid, lower-alkyl-substituted acrylic acid or alkyl ester thereof. The polyol can be a variety of compounds including glycerol, diglycerol or sugars such as sorbitol and mannitol. The solvent can be selected from THF or various other ethers such as diethyl ether. The reaction temperature is from 0 to about 100 ^{o}C. The phase of the reaction can be single or multiphased with the reactants in suspension or emulsion. Also water is removed from the solution during transesterification.

Brown et al. teach a process for the enzymatic synthesis of polyol acrylates by reacting an aliphatic polyol such as glycerol, digylcerol, triglycerol as well as the sugars of mannitol, adonitol, sorbitol and xylitol and many others (col 18, lines 35-50) with an

acrylic acid compound such as acrylic acid or ethyl or allyl acrylate (col 18, lines 33-35) with an enzyme such as esterases, lipases and acyltransferases (col 18, lines 46-47). The solvent may be hexane (col 32, lines 29), ether (col 20, lines 5-10) THF (col 18, line 45) or pyridine (col 10, line 17). The reaction temperature can be from 35-60 ^{o}C (col 12, lines 15-20). The reaction mix contains between 0.01 to 5% water (col 35, lines 5-6). The reaction can be single-phased (col 75, Example 3) or an emulsion (col 66, lines 25-30). Water is removed from the reaction via molecular sieves (col 67, lines 30-35) or counter-current diffuser (col 19, lines 20-23).

Therefore the reference anticipates claims 23, 24, 26-33, 35-38, 40 and 41.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 23-38, 40, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. as applied to 23, 24, 26-33, 35-38, 40 and 41 above and in further view of the following rational.

The description and rejection of claims 23, 24, 26-33, 35-38, 40 and 41 are listed in the 35 U.S.C § 102(b) rejection above. Claims 25, 34 and 42 limit the amount of the reactants such as the enzyme, polyol and acrylic acid compound used. While the reference listed above does not specifically teach the limitations, one of ordinary skill in

the art would recognize these amounts of reactants are result effective variables. Absent any teaching of criticality by the applicant concerning these amounts it would be *prima facie* obvious that one of ordinary skill in the art would recognize these limitations are result effective variables which can be met as a matter of routine optimization (M.P.E.P. § 2144.05 II).

Therefore the references listed above renders obvious claims 23-38, 40, 41 and 42.

Claims 23-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. as applied to claims 23-38, 40, 41 and 42 above, and further in view of Pettrone et al. (U.S. Patent # 5009805) and Perner et al. (U.S. Patent # 5009805).

The description and rejection of claims 23-38, 40, 41 and 42 are listed in the 35 U.S.C § 102(b) and 103(a) rejection above. Claim 39 limits that the reaction product of polyol monoacrylates is reaction with a comonomer to form a linear copolymer.

While Brown et al. teaches the production of a polyol monoacrylate he does not teach that these polyol monoacrylate can be polymerized with a comonomer. However Pettrone et al. teaches, like Brown et al. that glycerol as well as other polyols (Pettrone col 6, lines 15-30) can be esterified with acrylates (Pettrone, col 5, lines 10-20) using the alternative enzyme transacylase (Pettrone, Abstract). Pettrone et al. teach that these products are polymerizable monomers (Pettrone, Abstract). While Pettrone et al. does not teach that these products are polymerized to make co-monomers it is well established in the art that acrylate monomers are frequently used to make copolymers.

One instance is given in the patent of Perner et al. who teach that the acrylate-polyol esters (col 3, lines 1-25) can be used to form copolymers (Perner et al. col 7-8 and Abstract). It would have been obvious to someone skilled in the art in view of the teachings above to meet the limitations of claim 39. Pettrone et al. teach similar acrylate-polyol esters to Brown et al. and that these esters can be polymerized. Perner et al. teach that copolymers can be made from acrylate-polyol esters. Therefore it would have been obvious to someone skilled in the art to combine known prior art elements of acrylate-polyol esters according to known methods of copolymerization to yield the copolymers limited in claim 39.

Therefore the references listed above renders obvious claims 23-42.

In summary no claims, as written, are allowed for this application.

In response to this office action the applicant should specifically point out the support for any amendments made to the disclosure, including the claims (MPEP 714.02 and 2163.06). Due to the procedure outlined in MPEP § 2163.06 for interpreting claims, it is noted that other art may be applicable under 35 U.S.C. § 102 or 35 U.S.C. § 103(a) once the aforementioned issue(s) is/are addressed.

Applicant is requested to provide a list of all copending U.S. applications that set forth similar subject matter to the present claims. A copy of such copending claims is requested in response to this Office action.

CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thane Underdahl whose telephone number is (571) 272-9042. The examiner can normally be reached Monday through Thursday, 8:00 to 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached at (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon B Lankford Jr/
Primary Examiner, Art Unit 1651